

Claims

1. A bioassay plate having silver ions immobilized thereon.
2. The bioassay plate of Claim 1 wherein said plate is a polystyrene plate.
3. The bioassay plate of Claim 2 wherein said plate is a multi-well plate.
- 5 4. The bioassay plate of Claim 2 wherein said plate is a 96-well microplate.
5. A multi-well bioassay plate having silver ions immobilized thereon made by a method comprising:
- 10 a) functionalizing a multi-well bioassay plate to provide an amine - containing bioassay plate;
- b) adding a polymerized glutaraldehyde to the wells of said plate and maintaining for a time and under conditions to provide a glutaraldehyde - activated bioassay plate;
- 15 c) rinsing said plate with an aqueous solution;
- d) adding thiourea to the wells of said plate and maintaining for a time and under conditions whereby the thiourea reacts with the glutaraldehyde moiety of said glutaraldehyde-activated bioassay plate;
- e) rinsing said plate with an aqueous solution; and
- 20 f) contacting said plate with silver ions for a time sufficient to immobilize said silver ions on said plate.
6. The multi-well bioassay plate of Claim 5 wherein said polymerized glutaraldehyde is prepared by allowing 25 wt % glutaraldehyde to polymerize at about 70°C for about 24 hours.

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7. The multi-well bioassay plate of Claim 5 wherein said polymerized glutaraldehyde is maintained in the wells of said plate at about 37°C for about 24 hours.
8. The multi-well bioassay plate of Claim 5 wherein said thiourea is maintained in the wells of said plate at about 37°C for about 24 hours.
9. The multi-well bioassay plate of Claim 5 wherein said silver ions are added to said plate in the form of silver nitrate.
10. A method of making a multi-well bioassay plate having silver ions immobilized thereon comprising the steps of:
- a) functionalizing a multi-well bioassay plate to provide an amine-containing bioassay plate;
  - b) adding a polymerized glutaraldehyde to the wells of said plate and maintaining for a time and under conditions to provide a glutaraldehyde - activated bioassay plate;
  - c) rinsing said plate with an aqueous solution;
  - d) adding thiourea to the wells of said plate and maintaining for a time and under conditions whereby the thiourea reacts with the glutaraldehyde moiety of said glutaraldehyde activated bioassay plate;
  - e) rinsing said plate with an aqueous solution; and
  - f) contacting said plate with silver ions for a time sufficient to immobilize said silver ions on said plate.
11. The method of Claim 10 wherein said polymerized glutaraldehyde is prepared by allowing 25 wt % glutaraldehyde to polymerize at about 70°C for about 24 hours.
12. The method of Claim 10 wherein said polymerized glutaraldehyde is maintained in the wells of said plate at about 37°C for about 24 hours.

13. The method of Claim 10 wherein said thiourea is maintained in the wells of said plate at about 37°C for about 24 hours.
14. The method of Claim 10 wherein said silver ions are added to said plate in the form of silver nitrate.
- 5 15. A method for detecting an antigen comprising the steps of:
- a) incubating a multi-well bioassay plate having silver ions immobilized thereon with a biotinylated antibody having specificity for said antigen to provide a bioassay plate having said antibody immobilized thereon;
  - 10 b) incubating said plate with a solution containing said antigen;
  - c) washing said plate with an aqueous solution;
  - d) incubating said plate with a labeled antibody having specificity for said antigen;
  - e) washing said plate with an aqueous solution; and
  - 15 f) detecting said label, wherein detection of said label is indicative of the presence of said antigen.
16. A method for detecting a first antibody comprising the steps of:
- a) incubating a multi-well bioassay plate having silver ions immobilized thereon with a biotinylated antigen that is reactive with said first antibody to provide a bioassay plate having said antigen immobilized thereon;
  - 20 b) incubating said plate with an aqueous solution containing said first antibody;
  - c) washing said plate with an aqueous solution;
  - d) incubating said plate with an aqueous solution containing a labeled second antibody that binds to said first antibody;
  - 25 e) washing said plate with an aqueous solution; and

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- f) detecting said label, wherein detection of said label is indicative of the presence of said first antibody.

17. A kit for the detection of a first antibody comprising a first container containing a bioassay plate having silver ions immobilized thereon.

5 18. The kit of Claim ~~17~~ further comprising a second container containing a biotinylated antigen that is reactive with said first antibody.

19. The kit of Claim 18 further comprising a third container containing a labeled second antibody that binds to said first antibody.

10 20. A kit for the detection of an antigen comprising a first container containing a bioassay plate having silver ions immobilized thereon.

21. The kit of Claim 20 further comprising a second container containing a biotinylated antibody having specificity for said antigen.

22. The kit of Claim 21 further comprising a third container containing an antibody having specificity for said antigen.

15 23. An apparatus for activating microplates comprising:  
a) a housing;  
b) a reagent addition/withdrawal chamber disposed in said housing, said reagent addition/withdrawal chamber including reagent and wash storage containers in communication with a manifold, said manifold in  
20 communication with dispense lines disposed to deliver wash and reagent to a microplate, and further including aspirate lines in communication with the manifold, said manifold in communication with a waste container, said aspirate lines disposed to aspirate spent reagent from said microplate;

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- c) an incubation chamber disposed in said housing, said incubation chamber including a means for vertically delivering a non-reactive sealing plate to said microplate, and a means for heating and agitating said microplate.
- d) a means for horizontally conveying a microplate into and out of said addition/withdrawal chamber and between said addition/withdrawal chamber and said incubation chamber.

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